An appendix after page 16 includes a complete set for formal drawings.

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (Canceled):

Claim 2. (Currently Amended): ~~The substrate according to claim 1~~A substrate for an area array package,

said substrate having a plurality of signal wirings, each having a first contact adapted to be connected to a respective terminal of an integrated circuit, and a second contact on a periphery of the substrate,

said substrate having a ground structure including, for each signal wiring, a pair of rectangular ground plane portions located on opposite sides of the second contact of that signal wiring, and

said substrate having a plurality of ground via holes through the substrate, including at least one respective ground via hole through each rectangular ground plane portion,

wherein each ground plane portion has a plurality of ground via holes therethrough.

Claim 3. (Currently Amended): ~~The substrate according to claim 1~~ A substrate for an area array package,

said substrate having a plurality of signal wirings, each having a first contact adapted to be connected to a respective terminal of an integrated circuit, and a second contact on a periphery of the substrate,

said substrate having a ground structure including, for each signal wiring, a pair of rectangular ground plane portions located on opposite sides of the second contact of that signal wiring, and

said substrate having a plurality of ground via holes through the substrate, including at least one respective ground via hole through each rectangular ground plane portion,

wherein for each second contact, the respective ground plane portions are connected by a third ground plane portion on a third side of the second contact.

Claim 4. (original): The substrate according to claim 3, wherein the third ground plane portion has a plurality of ground via holes therethrough.

Claim 5. (original): The substrate according to claim 3, wherein the third ground plane portions of each second contact on at least a side of the substrate are continuously connected.

Claim 6. (Currently amended): ~~The substrate according to claim 1~~ A substrate for an area array package,

said substrate having a plurality of signal wirings, each having a first contact adapted to be connected to a respective terminal of an integrated circuit, and a second contact on a periphery of the substrate,

said substrate having a ground structure including, for each signal wiring, a pair of rectangular ground plane portions located on opposite sides of the second contact of that signal wiring, and

said substrate having a plurality of ground via holes through the substrate, including at least one respective ground via hole through each rectangular ground plane portion.,

wherein each pair of adjacent ones of the second contacts have a single rectangular ground plane portion therebetween.

Claim 7. (Currently Amended): ~~The substrate according to claim 1~~ A substrate for an area array package,

said substrate having a plurality of signal wirings, each having a first contact adapted to be connected to a respective terminal of an integrated circuit, and a second contact on a periphery of the substrate,

said substrate having a ground structure including, for each signal wiring, a pair of rectangular ground plane portions located on opposite sides of the second contact of that signal wiring, and

said substrate having a plurality of ground via holes through the substrate, including at least one respective ground via hole through each rectangular ground plane portion.,

wherein the substrate has an opening therethrough sized and shaped to receive the integrated circuit.

Claim 8 (Canceled):

Claim 9. (Currently amended): ~~The package of claim 8 , further comprising~~ An area array package comprising:

a substrate having:

a plurality of signal wirings, each having a first contact adapted to be connected to a respective terminal of an integrated circuit, and a second contact on a periphery of the substrate,

a ground structure including, for each signal wiring, a pair of rectangular ground plane portions located on opposite sides of the second contact of that signal wiring, and

a plurality of ground vias through the substrate, including at least one respective ground via hole through each rectangular ground plane portion;

a cover above the substrate,

a bottom layer of the package formed of a dielectric material; and

an intermediate dielectric layer between the bottom layer and the substrate, the intermediate dielectric layer having an additional ground structure thereon.

Claim 10. (original): The package of claim 9, further comprising a third ground structure between the bottom layer and the intermediate layer.

Claim 11. (original): The package of claim 9, wherein the additional ground structure has a ground opening around a signal via that is coupled to the second contact, the ground opening being generally shaped like a rectangle with two mitered corners.

Claim 12. (Currently Amended): ~~The package of claim 8~~ An area array package comprising:

a substrate having:

a plurality of signal wirings, each having a first contact adapted to be connected to a respective terminal of an integrated circuit, and a second contact on a periphery of the substrate,

a ground structure including, for each signal wiring, a pair of rectangular ground plane portions located on opposite sides of the second contact of that signal wiring, and

a plurality of ground vias through the substrate, including at least one respective ground via hole through each rectangular ground plane portion;

a cover above the substrate, and

a bottom layer of the package formed of a dielectric material,

wherein the package has a signal via beneath each second contact, and a ground via beneath each ground via hole, each of the signal vias and ground vias being electrically connected to a respective solder attach pad on the bottom layer.

Claim 13. (original): The package of claim 12, wherein each signal via is surrounded on three sides.

Claim 14. (original): The package of claim 13, wherein each signal via is surrounded by at least seven ground vias.

Claim 15. (Currently amended): ~~The package of claim 8, further comprising~~ An area array package comprising:

a substrate having:

a plurality of signal wirings, each having a first contact adapted to be connected to a respective terminal of an integrated circuit, and a second contact on a periphery of the substrate,

a ground structure including, for each signal wiring, a pair of rectangular ground plane portions located on opposite sides of the second contact of that signal wiring, and

a plurality of ground vias through the substrate, including at least one respective ground via hole through each rectangular ground plane portion;

a cover above the substrate,

a bottom layer of the package formed of a dielectric material; and

a superstrate above the substrate, the superstrate generally being formed of the same material as the substrate.

Claim 16. (original): The package of claim 15, wherein the superstrate has an opening therethrough above each second contact.

Claim 17. (original): The package of claim 16, wherein the opening above each second contact is cylindrical and is greater in diameter than the ground vias.

Claim 18. (original): The package of claim 16, wherein the opening above each second contact is filled with a material having a sufficiently low dielectric constant to reduce the radiation from a region of the second contact significantly.

Claim 19. (Currently amended): ~~The package of claim 8~~ An area array package comprising:

a substrate having:

a plurality of signal wirings, each having a first contact adapted to be connected to a respective terminal of an integrated circuit, and a second contact on a periphery of the substrate,

a ground structure including, for each signal wiring, a pair of rectangular ground plane portions located on opposite sides of the second contact of that signal wiring, and

a plurality of ground vias through the substrate, including at least one respective ground via hole through each rectangular ground plane portion;

a cover above the substrate, and

a bottom layer of the package formed of a dielectric material,

wherein the package includes a plurality of pockets, each pocket shaped and sized to accommodate an integrated circuit.

Claim 20. (Currently Amended): A printed circuit board assembly, comprising:

a printed circuit board having a circuit board substrate with circuit traces and a plurality of devices thereon, said plurality of devices including at least one integrated circuit package assembly that includes:

a package substrate having:

a plurality of signal wirings, each having a first contact adapted to be connected to a respective terminal of an integrated circuit, and a second contact on a periphery of the package substrate,

a ground structure including, for each signal wiring, a pair of rectangular ground plane portions located on opposite sides of the second contact of that signal wiring, each ground plane portion having a plurality of ground via holes therethrough, and

a plurality of ground vias through the package substrate, including ~~at least one respective~~ the plurality of ground via holes through each rectangular ground plane portion;

a lid above the package substrate, and

a bottom layer of the package formed of a dielectric material, the bottom layer having a plurality of solder attach pads, electrically connected to contacts of the circuit board substrate.

Claim 21 (Canceled):

Claim 22: (Currently Amended): ~~The package of claim 21~~ An area array package comprising:

a substrate having a plurality of signal wirings, each having a first contact adapted to be connected to a respective terminal of an integrated circuit, and a second contact on a

periphery of the substrate, the substrate having a signal via penetrating each second contact;

a superstrate formed of a dielectric material above the substrate, the superstrate having a respective opening therethrough above each second contact;

a lid above the superstrate; and

a bottom layer of the package formed of a dielectric material,

wherein the opening above each second contact is cylindrical and is greater in diameter than the ground vias.

Claim 23. (Currently Amended): ~~The package of claim 21~~ An area array package comprising:

a substrate having a plurality of signal wirings, each having a first contact adapted to be connected to a respective terminal of an integrated circuit, and a second contact on a periphery of the substrate, the substrate having a signal via penetrating each second contact;

a superstrate formed of a dielectric material above the substrate, the superstrate having a respective opening therethrough above each second contact;

a lid above the superstrate; and

a bottom layer of the package formed of a dielectric material,

wherein the superstrate is formed of the same material as the substrate.

Claim 24. (Currently Amended): ~~The package of claim 21~~ An area array package comprising:

a substrate having a plurality of signal wirings, each having a first contact adapted to be connected to a respective terminal of an integrated circuit, and a second contact on a periphery of the substrate, the substrate having a signal via penetrating each second contact;

a superstrate formed of a dielectric material above the substrate, the superstrate having a respective opening therethrough above each second contact;

a lid above the superstrate; and

a bottom layer of the package formed of a dielectric material,

wherein the substrate has a plurality of ground vias therethrough, at least partially surrounding each of the signal vias.

Claim 25. (original): The package of claim 24, wherein the substrate has a plurality of rectangular ground plane portions surrounding each of the signal vias on three sides, the ground vias penetrating the ground plane portions.

Claims 26-31 (Canceled):

32. (New): The assembly of claim 20, wherein for each second contact, the respective ground plane portions are connected by a third ground plane portion on a third side of the second contact.

33. (New): The assembly of claim 32, wherein the third ground plane portion has a plurality of ground via holes therethrough.

34. (New): The assembly of claim 32, wherein the third ground plane portions of each second contact on at least a side of the substrate are continuously connected.

35. (New): The assembly of claim 20, wherein each pair of adjacent ones of the second contacts have a single rectangular ground plane portion therebetween.

36. (New): The assembly of claim 20, wherein the package substrate has an opening therethrough sized and shaped to receive the integrated circuit.